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Georgia. Geological survey.

Administrative report of the state geologist. 1897, 1898. Atlanta, 1897, 1898.

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GEOLOGICAL SURVEY OF GEORGIA

W. S. YEATES, State Geologist

ADMINISTRATIVE REPORT

OF THE

STATE GEOLOGIST

For the Year Ending

October 15th, 1897

ATLANTA, GA.
Geo. W. Harrison, State Printer
(Franklin Ptg. & Pub. Co.)
1897

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OCTOBER 10TH, 1893



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THE ADVISORY BOARD

of the Geological Survey of Georgia

(Ex-Officio)

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GEORGIA STATE EXHIBIT OF MINERALS, ORES



STONES, TENNESSEE CENTENNIAL EXPOSITION.

ADMINISTRATIVE REPORT

GEOLOGICAL SURVEY OF GEORGIA,
ATLANTA, October 16th, 1897.

To His Excellency, W. Y. ATKINSON, *Governor, and President of the Advisory Board of the Geological Survey of Georgia,*

SIR: — I have the honor to submit my administrative report, for the year ending October 15th, 1897.

Each year, the administrative work of my office has increased, and the year just closed has been no exception to this rule. Many inquiries, as to the various mineral resources of the State continue to come in, from outside the State; and our own people have sought largely information from the Geological Survey, as to the minerals and ores occurring on their own properties. As much attention as possible has been given to these personal wants; but, since the law requires, that the Survey shall be made, systematically, after a settled plan, it is not at all improbable, that there may be some, who may not understand, why properties, in which they may be specially interested, have not been surveyed. For this reason, it may be well to say, that the policy of the Survey, as at present administered, is to take up each mineral or geological subject, which may, by proper exploiting, be made to prove a source of wealth to the State, and make a careful study of every occurrence of such subject, within her borders; then, from such field-

work, to prepare a popular report, which shall give, as comprehensive a description of such economic subject, as will at once be of value to the investor or operator, and to the general reading public. To this end, technicalities are avoided, only such use of them being made, as may be necessary to establish the character of the deposits, etc. It is the ultimate purpose of the Survey, to make a complete geological report on each county in the State, accompanied by topographical maps, on which will be indicated the various geological formations and deposits of minerals, occurring in such county. But, in order that this may be faithfully accomplished, and in order that the bringing of the State's mineral resources before the public may not have to wait upon a long and tedious survey of the entire territory, whether it furnish anything of economic value or not, it has been thought best, to make a preliminary survey of the material of probable economic value, first; to be followed by a full and scientific survey of the entire territory of each county. With this in view, economic surveys of the following subjects have been made: —

The *Marbles*, the *Corundum Deposits*, the *Gold Deposits* (in part), the *Water-powers* (in part), the *Phosphates* and *Marls* (in part), the *Clays* (in part) and the *Artesian-well System;* and much work has been done, during the past three months, on the *Road-building Materials* of the State. Those subjects, which have thus far been surveyed only in part, as above indicated, are either too extensive, or cover too large a territory, to be included in one of the bulletins of the Survey, which should not exceed one hundred and fifty pages in length.

PERSONNEL

Since my last report, no change has been made in the regular force, except the addition of a watchman for the State Museum. Mr. B. M. Hall was employed, for a short time, as hydrographer, to write up the results of field-work, done under his direction, for the Appendix to the Water-power bulletin, now about to issue from the press.

The following gentlemen have been employed at a nominal sum, during the year, as gauge-readers at the several stations, established along various streams in the State, in the survey of the water-powers: — Messrs. J. H. Lowry, C. E. Melton, J. P. Mercer, S. M. Barnett, Peter Pfeiffer, J. L. Cary, J. A. Moore, J. A. Low and Col. S. M. Carter. Col. Carter has performed the duty gratuitously; and the thanks of the Survey are due to him and to the U. S. Weather Bureau, which has furnished us with reports on the daily gauge-heights of the Oconee river at Dublin. Other gauge-readers, more recently employed, are Messrs. A. A. Almand and S. P. Power, Jr.; and Mr. W. T. Bass, who succeeds Mr. J. P. Mercer at Macon.

EQUIPMENT

To the equipment, as stated in my last administrative report, has been added a laboratory for testing the clays, fitted with the most modern and effective appliances, for ascertaining the points of fusion, tensile strength etc.

Two new wagons, built specially for our field-work, have replaced the old ones, which were nearly worn-out, when I assumed the office of State Geologist. These old wagons were a source of constant expense to the Survey; and I found, that the building of two new ones would be in the line of economy. The old wagons were sold at a fair price, and the money was applied to the settlement of the bill for the new ones. A camera, for use in making micro-photographs, was also added to our equipment, enabling us to reproduce in our reports sections showing rock structure.

The four horses, belonging to the Survey, were sold in the interest of economy, as it had become evident, that it was cheaper for us to hire horses, when actually needed for field use, than to own and board them, at their present depreciated values, when not in service. I suggested this to the Board, at its meeting in January last; but objection was very properly raised, that, as the horses would be needed, for field use in South Georgia, within six weeks time, the sale would best be postponed, till their return from the field. I again called attention to this matter, at the meeting of the Board, June 5th; and a committee was appointed and directed to sell two of the horses, with the understanding, that the other two would be needed within a week or two for field use. Subsequent to this, having learned, that my Assistant would be detained in Atlanta, on laboratory and office duty, longer than was supposed, I notified the Board, at a called meeting in July, and I was directed to sell the other two horses, which I did, as soon as a purchaser could be secured. The funds resulting were applied by the Board to the current expenses of the Survey.

During the year, 41 books and periodicals have been added to the Survey library, making a total, to date, of 352.

FIELD WORK

Work was continued on the Gold deposits of Lumpkin county, last fall; as it had not been quite completed, when my last administrative report went to press. Mr. McCallie was called on to assist me in the extensive field-work, in this county, as urgent office duties required me to spend much of my time in Atlanta.

In connection with the work of preparing an exhibit of the mineral resources of the State, for display at the Tennessee Centennial Exposition,[1] and in pursuance of the regular duties of the State Geologist, a number of short trips were made to various parts of the State, and some interesting material was secured for the permanent exhibit of the State Museum.

The months of February, March and April, and a part of May, were spent by Mr. McCallie in field-work, in south Georgia, making a survey of the Artesian-well system, during which time he covered a considerable number of counties, lying south of the crystalline belt, and practically completing the field-work on this subject. The most of this data he has, since, put in the form of a report, which will soon be ready for publication. In the latter part of July, I assigned him the work of making a survey of the road-building materials of the State, and he has been constantly in the field since then, having visited and made examinations of the road-building materials of Catoosa, Walker, Whitfield, Murray, Gordon, Chattooga, Bartow, Floyd, Polk, Paulding, Cobb, Fulton, Hall, Banks, Franklin, Habersham, Hart, Madison, Clarke, Jackson, Oglethorpe, Elbert, Wilkes, Green, Morgan, Oconee, Walton, Warren, McDuffie,

[1] For full description, see page 12.

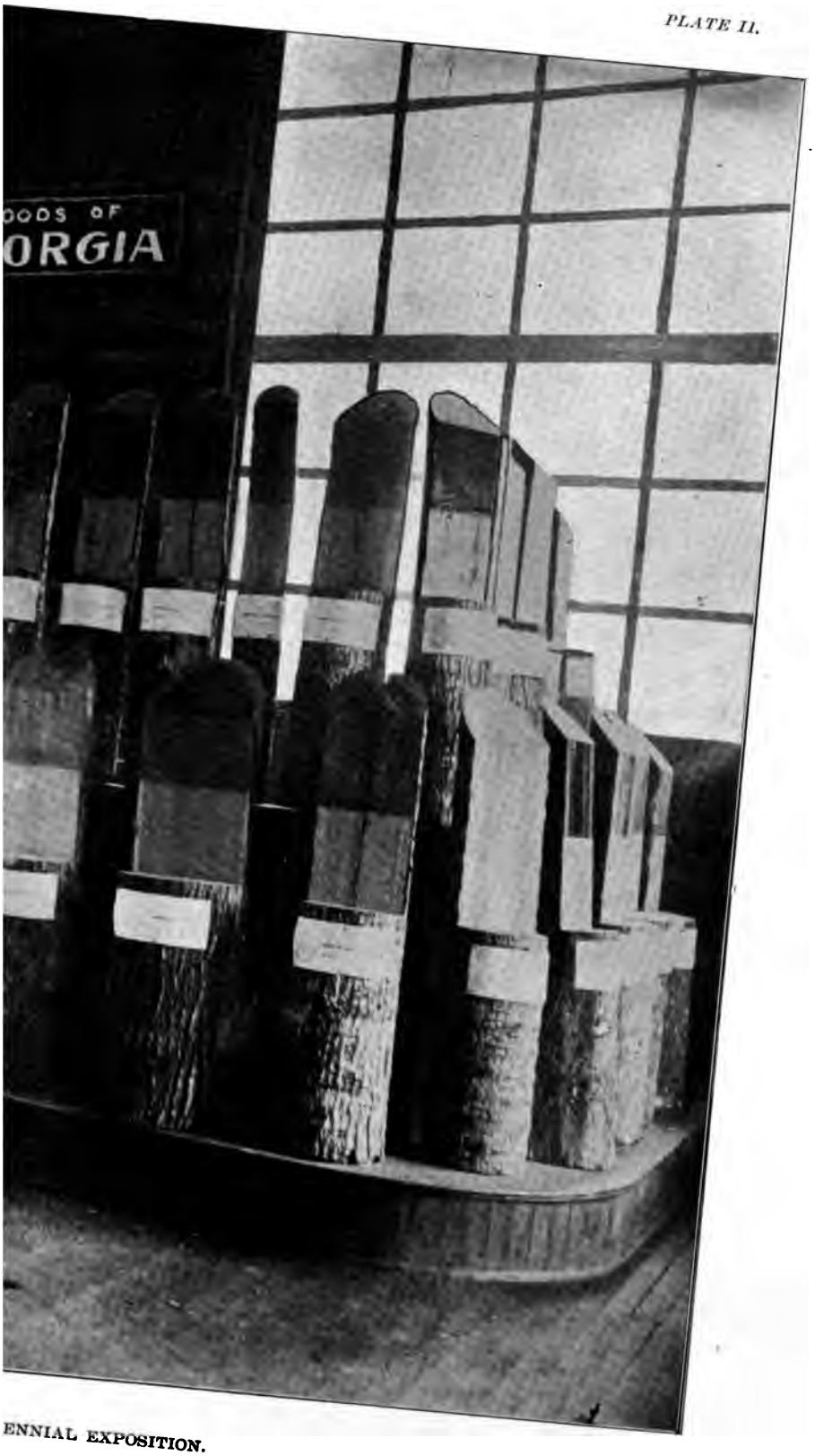
Richmond, Hancock and Baldwin counties, in all, thirty-two. Mr. McCallie estimates, that four months more of field-work will complete this subject, in which case we will be able, early next fall, to send a bulletin to press, that will cover the entire State on ROAD-BUILDING MATERIALS.

Dr. Ladd has continued the field-work on the CLAYS OF GEORGIA, which was begun early in the year 1896. In reconnaissance, he has located and sampled the fire-clays of the Potomac formation in Muscogee, Marion, Butler, Crawford, Washington, Hancock, Glascock, McDuffie, Richmond and Columbia counties. In detail work, as far as conditions allowed, the clays in Jones, Baldwin, Wilkinson, Twiggs and Bibb counties have been surveyed.

The joint work of this Survey and the U. S. Geological Survey, on the WATER-POWERS OF GEORGIA, has been kept in active operation throughout the year, and Mr. B. M. Hall, Hydrographer of the U. S. Geological Survey for the States of Georgia, Florida, Alabama and Tennessee, has been in charge of the work. Gauge-stations have been in constant operation at Carter's, on the Coosawattee river; at Oakdale and West Point on the Chattahoochee; at Macon on the Ocmulgee; at Resaca on the Oostanaula; at the Seaboard Air Line bridge on the Savannah; at Canton on the Etowah; and at Carey and Dublin on the Oconee. Since July 1st, a station has been in operation at Molena on the Flint river, and one at Carlton, on the Broad river. A station was also established at Almon on the Yellow river, September 10th.



GEORGIA STATE EXHIBIT OF W



ENNIAL EXPOSITION.

REPORTS

Of the four reports, mentioned in my last Administrative report, the one on the CLAYS OF GEORGIA was withdrawn from the press, the latter part of March, by my Assistant, Dr. Ladd, in order to incorporate not only additional data collected in the field, since the report had been sent to press, but also a considerable amount of valuable laboratory work, which had been done, during the winter. Both the field and laboratory work having been continued, since then, Dr. Ladd has retained the report, in order to perfect it. Recently, he has placed in my hands a hundred and forty-five pages of typewritten matter, which I am now editing, and which will soon be ready for the press. The remainder of the report, embracing all his field-work, he promises to turn over to me, at an early day. It will then be returned to the printer.

Of the other three reports, all are far advanced; and, in all probability, two of them will issue from the press by the end of this month. The one on the GOLD DEPOSITS, which is by far the largest bulletin, yet issued by the Survey, is about three-fourths in type. An appendix of fifty pages has been added to the Water-power bulletin, already in the hands of the printer, bringing the report on this work of the Survey, up to July 1st, 1897.

I am informed by Mr. McCallie, that his report on the ARTESIAN-WELL SYSTEM OF GEORGIA is more than half completed.

WORK PLANNED

During the coming year, the report on The ROAD-BUILDING MATERIALS of Georgia will be finished and the report submitted. Field-work for the second and last of the bulletins on THE GOLD DEPOSITS will be undertaken; and for another bulletin on the CLAYS OF GEORGIA. The work on the WATER-POWERS of the State, it is my purpose to continue, until the subject is complete. This information bids fair to be of great use to Georgia, at no distant day. With the advance of electricity, there will undoubtedly be a greater demand for water-power.

In the latter part of the coming winter, field-work will be continued, and probably completed, on the PHOSPHATES AND MARLS. One of the most important pieces of work before us is a survey of the excellent granites and gneisses of this State; and I hope to begin this work, and have it well under way, before October 1st, next. A scientific and practical study of the soils of the State will be a part of the work, to be taken up at as early a date as possible, to be illustrated by properly mounted samples, for exhibition in the State Museum; and a survey of the useful woods of the State, with locations, approximate acreage etc., will be undertaken, as soon as possible. With the small force at my disposal, it is impossible to meet the many demands for information on the large and various mineral and forestry resources of the State. The work could be more rapidly accomplished, and become the sooner available, as a source of revenue, if a larger appropriation, per annum, could be devoted to this effective means of advertising the State's material resources.

STATE MUSEUM

On account of the removal of the greater part of the Museum exhibits to the Tennessee Centennial Exposition and the large amount of necessary detail work, in connection therewith, little has been done, towards increasing the number of specimens on exhibition. Still, 178 new specimens have been catalogued, and a considerable number of others have been collected, which have not yet been identified, catalogued and classified. These will receive proper attention, during the coming winter.

Last entry in catalogue, for year ending October 15th, 1897, 1,542.

Last entry in catalogue, for year ending October 15th, 1896, 1,470.

Five eight-inch dressed cubes of building-stones have been added to the systematic series, and a series of cut quartz and moonstone, secured this Spring, give greater brilliancy to the fine gold and gem case. A number of new specimens have improved the general appearance of the systematic series of ores, and several handsome specimens have been added to the mineral series.

I greatly regret, that the funds, appropriated for the Survey, are not sufficient to enable me to have suitable cases built, for the proper preservation and exhibition of the excellent collection of ores, which I am now compelled to exhibit on tables, where they are at the mercy of relic-hunters and other thoughtless people, who enjoy scratching and otherwise defacing valuable specimens. I hope, by rigid economy, during the next year, to be able to save funds, sufficient to build at least one suitable case for the ore collection.

During the past year, I have had built for the exhibition of the gems and fine gold specimens of Georgia a small, but handsome



mahogany and plate-glass case, which is now on exhibition at the Exposition at Nashville.

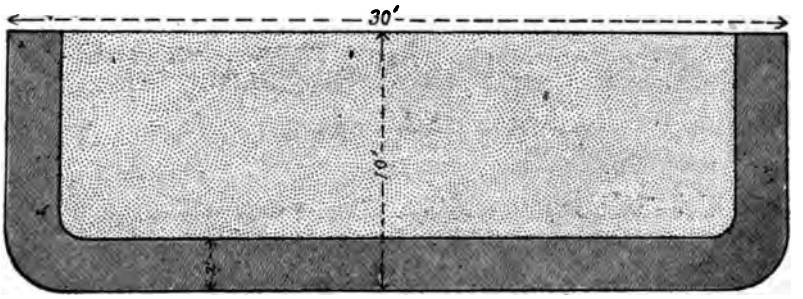
I hope to be able to give a great deal of my personal attention to the Museum, during the coming year, after the exhibits at Nashville shall have been returned to Atlanta. It is my purpose to install such special exhibits, as will illustrate the various economic bulletins, which the Survey publishes, from time to time; such exhibit to have one or more copies of the bulletin, on that particular subject, within easy reach.

MINERAL AND FORESTRY EXHIBIT—TENNESSEE CENTENNIAL EXPOSITION

At its meeting in February, I was directed by the Legislature, to assist the Commissioner of Agriculture, in making a display of the State's material resources, at the Tennessee Centennial Exposition, to open in Nashville, May 1st. As State Geologist, it became my duty, in this connection, to plan, prepare and install such an exhibit of the mineral and forestry resources, as would reflect credit on the State, and attract the attention of investors. To do this properly would necessitate the expenditure of a considerable part of the $1,500, which the Legislature had directed the Commissioner of Agriculture to expend on a State Exhibit at Nashville; for minerals, building-stones, ores and forestry specimens are all heavy, and expensive to handle. For the purposes of this exhibit, the Director General of the Exposition assigned me a space 71 x 18 feet, on the south side of the Minerals and Forestry Building, beginning in the southeast corner, at one of the principal entrances

to the building. After planning my mineral exhibits, and locating them to the best advantage,[1] I found, that there would be no space for making a forestry display. Communicating this fact to the Director General, and furnishing him a diagram, showing how I proposed to use the space he had assigned me, Georgia was favored, by his recalling 300 square feet of space already assigned, and re-assigning it, for the display of the Woods of this State.[2] It being evident, that this space would accommodate only a fourth of the Systematic Series of Georgia Woods in the State Museum, I thought it best, not to disturb the series on exhibition in the Museum, but,

Fig. 2



FLOOR PLAN OF PLATFORM USED TO DISPLAY FORESTRY COLLECTION, GEORGIA STATE EXHIBIT, TENNESSEE CENTENNIAL EXPOSITION.

to select a series of the best specimens among our duplicates, and to have these properly dressed, after their arrival in the Exposition building. The exhibits of minerals, ores and building-stones were all on display, on the day of the opening of the Exposition; but the classification and labelling had to be done, subsequently. The preparation of the Woods necessitated a delay in their installation; but, as soon as possible, they were put in a presentable condition, and effectively mounted on a special platform stand, similar to those

[1] See fig. 1.

[2] See diagram of space, fig. 2.

in the State Museum. Each specimen bore a label, giving its botanical and its common name or names; its locality; and its general distribution throughout the State, indicated by green water-color on a county-map of the State, printed on one end of the label. Over this exhibit was suspended a large sign, 6 feet x 1 foot 2 inches, bearing, in large gold bronze letters on black, the words, WOODS OF GEORGIA.

THE SYSTEMATIC SERIES OF MINERALS, numbering between 400 and 500 specimens, all found in Georgia, was contained in four of the mahoganized cherry and plate-glass cases, belonging to the State Museum. The specimens are effectively mounted on black ebonized blocks, and each bears a neatly printed label, giving the name of the mineral or minerals, composing the specimen, its locality etc.

THE SYSTEMATIC SERIES OF ORES is classified and displayed, on four special tables, each specimen being accompanied by a printed label, similar to the mineral labels, but giving, in addition, the kind of ore exhibited in the specimen. Besides these, the ore collection was supplied with a series of large group-labels, mounted on pedestals, and easily read at a distance of twenty feet.

THE SYSTEMATIC SERIES OF BUILDING-STONES, numbering 55 eight-inch dressed cubes, is displayed on an oblong stepped pyramid, similar to the one in use in the State Museum, for the same purpose. Each cube is mounted on an ebonized block, on which is a printed label, similar to those used for the mineral and ore specimens. Over this pyramid is suspended an eight-foot black and gold bronze sign, bearing, in large letters, the words, BUILDING-STONES OF GEORGIA.

Grouped in three of the large windows, overlooking the mineral exhibits, are fourteen large photographic transparencies, varying in size, from 15 x 22 inches to 25 x 40 inches. The subjects are all

handsome illustrations of Georgia scenery, and include among them such striking objects, as the Witch's Head, at Tallulah Falls; the High Falls of the Towaliga; Toccoa Falls; Fairview Lake in Decatur county; Stone mountain, from its north side, etc. Above these views is suspended a large eight-foot sign, with the words, GEORGIA SCENERY, in six-inch gold bronze letters on black.

SPECIAL EXHIBITS

At my solicitation, a number of producers and finishers contributed, as loans, some very valuable exhibits. THE GEORGIA MARBLE COMPANY, OF TATE, loaned us 4 beautiful eight-foot Corinthian columns, and 4 translucent slabs, of their several kinds of marbles; and THE SOUTHERN MARBLE COMPANY, OF MARBLE HILL, loaned us their magnificent exhibit of white marble, which was a part of the State's exhibit at the Cotton States and International Exposition, and which is fully described in my administrative report for 1896. In addition to this, the SOUTHERN MARBLE COMPANY furnished us a handsome fifteen-foot Corinthian column of white marble, which forms the central piece of our special exhibit of GEORGIA MARBLE. THE KENNESAW MARBLE COMPANY, OF MARIETTA, furnished for this exhibit an exquisite wainscoting of Creole marble, which was fitted along the wall, just back of this special marble exhibit, besides lending us two attractive monuments of medium size, and a vase, mounted on a turned and polished column. One monument and the vase were of Creole marble, while the other monument was of Etowah. MESSRS. GEORGE B. SICKELS & CO., OF TATE, furnished a handsome tiled floor, of special design, of the Creole, Etowah and Kennesaw Marbles; and THE GEORGIA MAR-

BLE FINISHING WORKS, OF CANTON, contributed two handsome monuments, one of Etowah and the other of Creole Marble. Two large vases on turned columns of the white, pink and mottled black and white marbles, and a very pretty Creole monument, were contributed by THE BLUE RIDGE MARBLE COMPANY, OF NELSON.

The massive exhibit of white marble from THE SOUTHERN MARBLE COMPANY, not including the fifteen-foot column, had to be displayed on special space, at the west end of the Minerals and Forestry Building, assigned by the Director General for that purpose. The several columns, monuments and vases were mounted on the marble tile floor, which was about 18 feet square; and, as before stated, the marble wainscoting was fastened up against the wall, adjoining this space. From the large window above this, four of the glass panes were taken, and the four translucent marble slabs were substituted, so that the light passed through, producing a beautiful effect. A similar slab of serpentine, received from THE VERDE ANTIQUE MARBLE COMPANY, OF CHICAGO, was placed in another window; but, on account of the dark green of the serpentine, not sufficient light was transmitted to render it as effective as was desired. Over the special marble exhibit was hung an eight-foot black sign, on which, in six-inch gold bronze letters, were the words, GEORGIA MARBLE.

Besides the special exhibit of marbles, an exquisite eight-foot column of the serpentine from Holly Springs, in Cherokee County, and a card receiver on a polished turned column of the same material, were loaned by THE VERDE ANTIQUE MARBLE COMPANY, OF CHICAGO, whose quarries are at Holly Springs. The large column was surmounted with a Corinthian cap covered with gold leaf, upon which rested a polished ten-inch ball of the serpentine. For brilliancy of effect, this special exhibit is hardly equalled, by anything at the Exposition.

Other special exhibits, were a series of the Rockmart Slate, which had been furnished the Geological Survey for the Cotton States and International Exposition, by THE GEORGIA SLATE COMPANY, OF ROCKMART; a handsome display of the Bowden Lithia Water, loaned by THE BOWDEN LITHIA WATER CO., OF ATLANTA, in pint, quart and half-gallon bottles, arranged on a pyramid and surmounted by a car-boy of this water; a display of sewer-pipe, furnished by H. STEVENS' SONS, OF MACON; a large polished slab of blue granite from the Venable & Collins quarry at Oglesby, loaned by THE VENABLE AND COLLINS GRANITE COMPANY, OF ATLANTA; and two large, dressed blocks, one of sand-stone from Catoosa county, belonging to the State Museum, and the other of Sparta granite, from Hancock county, the gift of THE GEORGIA QUINCY GRANITE COMPANY, OF MACON.

The special fine case, containing the collection of gems, gold nuggets and other fine gold specimens, which has stood in the corridor of the capitol, in front of my office, completes the mineral display. Across the exhibit of minerals, ores, building-stones etc., hangs a ten-foot sign, with the word GEORGIA, on each side of it, in eight-inch gold-bronze letters on a maroon background, which can be easily read, the entire length of the building.

This exhibit of Minerals and Forestry of Georgia has been profusely complimented, and it is said, by several of the principal officers of the Exposition, to be the best exhibit they have. I have taken much interest, in making this display of Georgia's mineral and forestry resources one, that would be, in every way, creditable to this great State; and it has been said, by persons competent to judge, that no State exhibit, from any Southern State, at any Exposition, has equalled it.

MISCELLANEOUS WORK

In addition to the regular duties of State Geologist, I have been able to determine and report on 108 specimens of minerals, sent in by persons throughout the State, for examination and report.

ACKNOWLEDGMENTS

The following gifts. received from friends of the Survey, during the year, have been catalogued as follows: —

MR. N. Z. GLENN, THOMASTON, GA.

One specimen of Corundum Crystals, Upson County.
One specimen of Feldspar, Upson County.
One specimen of Feldspar and Quartz, Upson County.
One specimen of Tabular Quartz, Upson County.
Three specimens of Feldspar, Upson County.
One specimen of Staurolite Crystal, Upson County.
Two specimens of Kyanite Crystals, Upson County.
One specimen of Ilmenite, Upson County.
One specimen of Magnetite, Upson County.
One specimen of Kyanite Crystal, Upson County.
Seven specimens of Corundum Crystals, Upson County.

MR. JOHN B. ATKINSON, PRESIDENT ST. BERNARD COAL CO., EARLINGTON, KY.

One specimen of Free Gold in Quartz, Tahloneka Mine, Dahlonega.

JUDGE W. W. MURRAY, HUNTINGDON, TENN.

Five specimens of Free Gold in Quartz, Preacher Mine, Dahlonega.
One specimen of Free Gold with Auriferous Pyrite in Quartz, Tahloneka Mine, Dahlonega.

One specimen of Native Gold in Quartz, Singleton Mine, Dahlonega.

One Specimen of Auriferous Pyrite in Quartz, Mary Henry Mine, Dahlonega.

MESSRS. VENABLE BROTHERS, ATLANTA, GA.

One specimen of Granite (8-inch cube), Stone Mountain, DeKalb County, Ga.

One specimen of Granite (8-inch cube), Lexington.

MR. GEORGE H. CLARKE, CEDARTOWN, GA.

One specimen of Iridescent Limonite, Cedartown.

CAPT. J. W. WEAVER, DAHLONEGA, GA.

Six specimens of Free Gold with Limonite in Quartz, Singleton Mine, Dahlonega.

MR. J. G. FANNING, ADASBURG, WILKES COUNTY, GA.

One specimen of Quartz, Adasburg, Wilkes County.

CAPT. J. A. COTTEN, THOMASTON, GA.

One specimen of Quartz Crystal, Wilmot Farm, 3 miles S. E. of Thomaston, Upson County.

One specimen of Limonite, Talbot County.

One specimen of Corundum Crystals, Lot 89, 16th District, Upson County.

One specimen of Egg-shaped Quartz Pebble, 7 miles S. E. of Thomaston, Upson County.

MR. J. J. WALLACE, BEN HILL, GA.

Fifty specimens of Quartz Crystals, Fulton County.

MR. J. E. COLWELL, ATLANTA, GA.

One specimen of Asbestus with Decomposed Chlorite, Paulding County.

MR. JOHN HUFF, DAHLONEGA, GA.

Five specimens of Free Gold in Quartz, Calhoun Mine, near Dahlonega.

MR. L. A. JEHAN, CARTERSVILLE, GA.

Three Pyrite Crystals, Gwinnett County.

MR. E. O. BUTTS, MADISON, GA.

One specimen of Limonite, near Gainesville.

MR. T. D. O'KELLEY, CALEB, GA.

One large Muscovite Crystal, Gwinnett County.

MR. W. W. GRANT, ATLANTA, GA.

One specimen of Chromite, Meriwether County.

ACKNOWLEDGMENT TO THE ADVISORY BOARD

In conclusion, it gives me pleasure to acknowledge my indebtedness to the members of the Advisory Board, for their kind considerations of the needs of the Survey, and for their friendly interest in our work. I am

Very respectfully yours,

W. S. YEATES,

STATE GEOLOGIST.







Ga
W. Brannen

GEOLOGICAL SURVEY OF GEORGIA

W. S. YEATES, State Geologist

ADMINISTRATIVE REPORT

OF THE

STATE GEOLOGIST

For the Year Ending

October 15th, 1898

ATLANTA, GA.
GEO. W. HARRISON, STATE PRINTER
(Franklin Prtg. and Pub. Co.)
1898

GEOLOGICAL SURVEY OF GEORGIA

With the compliments of

W. S. Yeates,

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THE ADVISORY BOARD

of the

Geological Survey of Georgia

(Ex-Officio)

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ADMINISTRATIVE REPORT

GEOLOGICAL SURVEY OF GEORGIA,
ATLANTA, October 16th, 1898.

To His Excellency, W. Y. ATKINSON, *Governor and President of the Advisory Board of the Geological Survey of Georgia:* —

Sir: — I have the honor to submit my administrative report, for the year ending October 15th, 1898.

The administrative duties of the office have, as usual, required a large portion of my time; but the preparation of my report on the gold deposits of Lumpkin county, and the editing of the extensive bulletin, on the occurrence and development of gold in those counties, included in the Dahlonega and Hall County gold belts, have occupied much of my own time, during the year. Numerous inquiries, by letter, as to the character and availableness of various mineral resources of Georgia, have been received from people outside of the State; and many such have been received from our own people. Much attention has been called to the material resources of the Southern States, during the past few years, especially to those of Georgia; and these inquiries come, generally, from persons seeking investments, either for themselves, or for others, for whom they are agents.

During the past field-season, my time has been so constantly occupied by administrative duties, and in editing reports, that I have been

able to make only short trips into the field, here and there. Probably, the most important one of these was made, in answer to a request of the Mayor of Columbus, asking, that I make a special examination of the country around that city, and inform him, if it were at all feasible, for the city, or for individuals, to bore for a supply of artesian-well water, within the corporate limits. I made the necessary examination; and, finding that the Geological conditions would not justify a favorable report, I was compelled to report against the project. By this report, the city was saved the useless and heavy expense of an experiment, which, I was informed, many of the citizens, up to that time, had favored.

Last Spring, in order to illustrate the value of the aluminum ore of Georgia, at The Omaha Exposition, and with a view to incorporating the exhibit in the State Museum, on its return to Georgia, I corresponded with The Pittsburg Reduction Company, of Pittsburg, Penn., and with a number of aluminum manufacturers, and secured the gift of 57 specimens of wire, angles, toilet articles, tableware, cooking utensils etc., made from Georgia bauxite. With these, and handsome specimens of the ore, already in the Museum, I was able to make up a very attractive case, illustrating this valuable mineral resource, in which Georgia is probably richer, than any other State in the Union.

Requests for the identification of minerals continue to come to my office, from people living in different parts of the State, some coming by mail, and some by express; while others are made by persons visiting Atlanta, and bringing minerals with them for identification. Of these, I have identified and reported on 78 minerals and rocks, during the year.

WORK OF THE ASSISTANT GEOLOGISTS

In October and November, 1897, after my last report was submitted, Mr. McCallie continued field-work on the road-building materials of Georgia, which work he continued, during a part of the past season. Having collected enough data, to justify the publication of a bulletin on this subject, he was recalled from the field, August 1st, and was directed to begin the preparation of his report, which, he estimated, would be ready for publication, the last of December. During the season, his operations covered the counties of Butts, Jasper, Jones, Monroe, Upson, Pike, Talbot, Coweta, Carroll, Douglas, Cobb, Baldwin, Decatur, Campbell and Henry, these counties, with those previously surveyed, practically completing the field-work on the road-building material in the northern and central parts of the State. This work has revealed the fact, that these sections can supply an abundance of excellent road-building material, the trap rocks, which are the best for macadamizing roads, being plentiful throughout the Crystalline Belt, and much of it, most favorably located for transportation by railroads.

The office work, done by Mr. McCallie, has consisted in finishing the report on the Artesian-Well System of Georgia, and in writing a considerable part of the report on the Roads and Road-Building Materials of Georgia.

As will be seen, hereafter, Dr. Watson's tenure of office, as Assistant Geologist, began, the middle of last April. Before designating his field-work, for the season, I assigned to him, as a specialist, the petographic study of a number of rocks, which I had collected, in my investigation of the geology of the gold belt in

Lumpkin county. His results are published in the Bulletin on the Gold Deposits, as an addendum to that division of my report.

As the Survey is not provided with a regular chemist, in tendering him the appointment of Assistant Geologist, I was compelled to couple with it the duty of doing, at my discretion, such chemical investigation as might be required by the Survey. In the performance of this duty, he has made assays of 14 samples of gold ores, and has identified about 30 minerals and rocks.

After his discharge of these duties in the laboratory, I assigned Dr. Watson to a systematic study of the granites and gneisses of the State, one of the most important of its economic mineral resources, to be exploited. His special training rendered his assignment to this duty, of exceptional value to the State; and, as a result, I can, with confidence, predict a valuable report, on this great economic interest. Thus far, he has completed the field-work on the granites and gneisses of DeKalb, Gwinnett, Rockdale, Newton, Morgan, Greene, Hancock, Warren, Wilkes, McDuffie, Columbia and Richmond counties; and he is now actively engaged on this work, in other counties. His reports, so far, are most encouraging. In the counties above named, he has carefully collected, from each locality visited by him, specimens for laboratory study, and 12-inch cubes, in duplicate, from which 8-inch cubes are to be dressed and added to the systematic collection of Georgia's building-stones, which is now on display at THE TRANS-MISSISSIPPI AND INTERNATIONAL EXPOSITION, at Omaha, Nebraska. Dr. Watson expects to have this report ready for the press, not later than next Spring.

streams at various seasons and stages, during the year, using the latest improved and most reliable current-meters, for the purpose. I hope to be able, soon, to have the topographic survey of the streams continued, and to locate such falls and shoals, as have not, hitherto, been mapped. This is a matter of great importance to the State; and, but for the fact, that the appropriation for the Survey has been, and is, now, too meagre, to do this and other urgent work, at the same time, this work would now be well advanced.

PERSONNEL OF THE SURVEY

Mr. S. W. McCallie, Assistant Geologist, still continues with the Survey.

In April of this year, I appointed to the position, made vacant by the resignation of Dr. Ladd, Assistant Geologist, near the close of the field-season of 1897, Dr. Thomas L. Watson of Virginia, who came to the Survey, admirably equipped for its work.

After graduating at the Agricultural and Mechanical College of Virginia, he was retained for five years, as instructor in Geology, Mineralogy and Chemistry in the College, and as Assistant Chemist of the Virginia Experiment Station, which position he voluntarily resigned, in order to continue his scientific studies, without trammel. For some time, he pursued post-graduate work at the University of Virginia, after which he spent the equivalent of three scholastic years at Cornell University, graduating from that institution, in

June, 1897, with the degree of Doctor of Philosophy. A part of that summer, he spent, as Assistant Geologist on the Geological Survey of Indiana, investigating the coal-fields of that State; but he was soon called home by the serious illness of a relative; and, while there, he was attacked by malarial fever; and was not able to resume his duties. He then began a study of some of the eruptive rocks of Virginia, concluding this work at the National Museum in Washington, where he spent last winter and part of the spring.

The application of Dr. Watson, for the vacancy on this Survey, was accompanied by the strong endorsements of his professors at the Agricultural and Mechanical College of Virginia, the University of Virginia, and Cornell University; also by copies of published original papers by him, on chemical and geological subjects.

At the regular session of the Legislature in 1897, the law, requiring the Commissioner of Agriculture to furnish whatever clerical help might be needed by the Geological Survey, was repealed. It then became necessary for the Survey to employ a clerk. So, with the consent of the Advisory Board, I appointed as clerk, January 1st, 1898, Mr. F. E. Ellis, who, for nearly two years, had been serving in that capacity, as an employee of the Department of Agriculture.

A watchman for the State Museum has been employed, continuously, during the year.

The collecting of data for the next report on the water-powers has necessitated the employment of gauge-observers, at the several stations on the rivers indicated, as follows: —

Observer	Station	River
H. S. Weems[1]	Carter's	Coosawattee
S. M. Barnett	Resaca	Oostanaula
Jas. A. Low	Canton	Etowah
W. M. Towers[1]	Rome	Coosa
J. H. Lowry	Oakdale	Chattahoochee
C. H. Turner	" (Lower Gauge)	"
C. E. Melton	West Point	"
J. A. Moore S. K. Moore	Molena	Flint
Jno. E. Clark[2]	Albany	"
A. A. Almand	Almon	Yellow
W. T. Bass	Macon	Ocmulgee
J. L. Cary	Carey	Oconee
Jasper Young	Dublin	"
S. C. Cobb	Madison's Ferry	Tugalo
S. P. Power, Jr.	Carlton	Broad
P. J. Pfeiffer	S. A. L. Bridge	Savannah
J. M. Youngblood[3]	Augusta	"

With the exception of Messrs. Weems and Towers, who generously rendered the service, without compensation, and Mr. Clark, the Weather Bureau observer, and Mr. Youngblood, observer for the City of Augusta, these gentlemen were paid a small amount for their services. As before stated, Mr. B. M. Hall, Hydrographer for the U. S. Geological Survey for Georgia, Florida, Alabama and Tennessee, has been directly in charge of this field-work. Mr. Hall's services have been given, without compensation, for the sake of the co-operation between this and the Federal Survey.

[1] Service furnished gratis to the Survey. [2] Service furnished by the U. S. Weather Bureau.

[3] Service furnished by the City of Augusta.

EQUIPMENT

I have not found it necessary, during the year, to do much towards increasing the equipment of the Survey; as it is already very effective, enabling us to do our work to the best advantage. Machinery for testing the strength of building-stones, the resisting properties of road-material and other like testing machinery, are desirable; but, on account of insufficient appropriation, we find it necessary, to avail ourselves of such outside help, as we are able to secure.

During the year, the Survey library has been increased by 65 books and periodicals, making a total of 417. These have been received mostly from our exchanges.

REPORTS

Since my last annual Administrative Report, three economic reports have issued from the press, as follows: — Bulletin 3 – A, A Preliminary Report on a Part of the Water-powers of Georgia; Bulletin 4 – A, A Preliminary Report on a part of the Gold Deposits of Georgia; and Bulletin 5 – A, A Preliminary Report on a Part of the Phosphates and Marls of Georgia. These have had, and are now having, considerable distribution over different sections of the country. There has been a large demand for the Gold report, from various parts of this country and from England. These demands are being filled, as rapidly as possible. Two hundred copies

of this bulletin were sent to Ex-Governor Northen, the State's Commissioner at the Omaha Exposition, for distribution among mine investors visiting the exposition.

The report on the Clays of Georgia, which was mentioned, in my last Administrative Report, as having been withdrawn from the press by Dr. Ladd, was not entirely returned to me, until the 3rd day of this month, Dr. Ladd having left the Survey and the State, without finishing the report. Assuming new duties, this report was not completed, until recently. It is now in press; and, in due course of time, it will be issued, as Bulletin 6 – A, A Preliminary Report on a Part of the Clays of Georgia.

The Report on The Artesian-Well System of Georgia was placed in my hands, some time ago, by my Assistant, Mr. McCallie, to be edited and published. I shall place this in the hands of the printer, in a few days,[1] to be published, as Bulletin No. 7, A Preliminary Report on the Artesian-Well System of Georgia.

Field-work is now finished on the first report on the Roads and Road-building Materials of Georgia; and I am informed by my Assistant, that the work of writing the report is well advanced. This will be issued as Bulletin 8 – A, A Preliminary Report on a Part of the Roads and Road-building Materials of Georgia.

The field-work for a report on the granites and gneisses of Georgia was begun this summer; and it is now well under way. Before the present field-season closes, enough data will have been collected, to justify the publication of the first report of this series, to be known, as Bulletin 9 – A, A Preliminary Report on a Part of the Granites and Gneisses of Georgia.

[1] Since the date of this report, the report on the Artesian-well system of Georgia has been placed in the hands of the State Printer, and is now going through the press.

WORK PLANNED

On account of the resignation of Dr. Ladd, and the urgent necessity, that Mr. McCallie remain on office duty, in order to complete the report on the Artesian-Well System, I was unable to have the field-work resumed on the Phosphates and Marls, in the early Spring. It is my purpose to have this work continued in March, April and May next, beginning, if the weather is favorable, even before March. As soon as the administrative duties of my office will permit, I shall take the field, to collect data for a second report on the Gold Deposits of Georgia. This report will include those counties, having gold deposits, and not included in Bulletin 4 – A. When the field-work on these counties is finished, all the counties, reported on, in that bulletin, will be again visited; and all new developments, and all properties not discovered in the first survey, will form the subject for an additional report, to be included in Bulletin 4 – B, in this way bringing up to date all the developments in the gold-mining industry of Georgia.

STATE MUSEUM

Most of the specimens of the State Museum are now on display at the Omaha Exposition, having been turned over to THE GEORGIA STATE COMMISSION, TRANS-MISSISSIPPI AND INTERNA-

TIONAL EXPOSITION, in accordance with a resolution of the last General Assembly.

One of the most notable additions to the Museum, during the past year, was a collection of toilet articles and household- and kitchen-ware, made of aluminum, extracted from Georgia bauxite, by THE PITTSBURG REDUCTION COMPANY, of Pittsburg, Penn. This collection, I secured from a number of aluminum manufacturers, whose friendly interest I have duly acknowledged, under another division of this report. In connection with a series of aluminum ore (bauxite) from different mines in Georgia, I have arranged this collection of manufactured products as an exhibit, and installed it, in a plate-glass exhibition case, of the kind used for displaying the systematic collection of minerals. It is now on exhibition at Omaha. Since the founding of the State Museum in 1895, fourteen handsome gold nuggets, from the Hamby Mountain mine, in White county, have formed an important feature of this exhibition of Georgia's mineral resources. These nuggets were kindly loaned to the State by their owner, Mr. John Martin, of Cleveland, Georgia. In the early part of the year, Mr. Martin disposed of them; and, in order to save them from the melting-pot, it became necessary for the Geological Survey to purchase them, for a permanent exhibit in the Museum. THE GRAMLING-SPALDING CO., of Atlanta, kindly gave the State the refusal of these nuggets, at their actual gold value. Having ascertained this value, I was instructed by the Advisory Board to purchase them, thereby saving an exhibit of great worth, for advertising the State's material resources. I was also directed by the Board, to purchase a handsome collection of nine gold nuggets from the Loud mine in White county, owned by Mr. R. K. Reaves, of Athens, Ga. This is a splendid addition to the State collection, and attracts much

attention from visitors. Both the Martin and Reaves collections of nuggets can be readily sold, for the amounts paid for them, if it should ever become necessary for the State to dispose of them. I heartily concur in the action of the Board, in saving these valuable specimens, to constitute an attractive object-lesson advertisement for Georgia. These nuggets are mounted on black velvet pads, with suitable printed labels, and are displayed with other handsome free-gold specimens, and some of Georgia's gems, in a mahogany case with plate-glass top.

During the year, 232 specimens have been catalogued and added to the Museum collections.

Last Catalogue Entry, for Year Ending October 15th, 1898..... 1,691
Last Catalogue Entry, for Year Ending October 15th, 1897..... 1,542

I am constrained, to call the attention of the Legislature, through Your Excellency, to the necessity for suitable cases, in which to preserve and exhibit the handsome specimens of ores and building-stones, which I have been compelled to display on cheap tables. These specimens, which have been collected, at much expense, are subject to the handling and mal-treatment of visitors; and some vandals have gone so far, as to scratch and abuse some of the specimens exposed, and to even tear from the mounting-blocks the printed labels, describing the specimens. I had hoped, to be able to build one or two display-cases for the ore collection, from the regular appropriation of the Survey, during the past year; but it became necessary for me to employ a clerk, to be paid from this fund; and, for this reason, I was unable to build the cases.

ACKNOWLEDGEMENTS

The following gifts, received from friends of the Survey, during the year, have been catalogued, as follows: —

MR. W. L. DARNELL, ATLANTA, GA.

Three specimens or Pyrite in Quartz, from Fulton County.

MR. H. H. SUMMEROUR, DULUTH, GA.

Four specimens of Free Gold in Quartz, from Milton County.

MRS. F. B. ARRINGTON, QUITMAN, GA.

One specimen of Silicified Coral Geode, from Brooks County.

THE PITTSBURG REDUCTION CO., PITTSBURG, PENN.

Thirteen specimens of Aluminum Angles, Wire Etc., manufactured from the product of Georgia ore.

THE ILLINOIS PURE ALUMINUM CO., LEMONT, ILL.

Fifteen specimens of Aluminum Ware, manufactured from the product of Georgia ore.

MESSRS. S. D. CHILDS & CO., CHICAGO, ILL.

Nineteen specimens of Aluminum Ware, manufactured from the product of Georgia ore.

MESSRS. SIDNEY SHEPARD & CO., BUFFALO, N. Y.

Three specimens of Aluminum Ware, manufactured from the product of Georgia ore.

THE FLORENCE MANUFACTURING CO., FLORENCE, MASS.

Four specimens of Aluminum Ware, manufactured from the product of Georgia ore.

MESSRS. REYMOND & GOTTLOB, NEW YORK CITY.

Three specimens of Aluminum Ware, manufactured from the product of Georgia ore.

MR. J. W. BISHOP, WOODBURY, GA.

One specimen of Quartz and Chlorite, from Meriwether County.

MESSRS. PATTERSON BROTHERS, ATLANTA, GA.

One specimen of Marble, from Catoosa County.

MR. J. M. POUND, POUND P. O., GA.

One specimen of Quartz, from Upson County.

MR. J. M. DORSON, SWIFTON, GA.

One specimen of Quartz, from Upson County.

MR. H. L. BENNETT, ATLANTA, GA.

Thirty specimens of Corundum, from Cobb County.

MESSRS. W. M. SCOTT & CO., ATLANTA, GA.

One specimen of Beryl, from Georgia.

AWARDS AT THE TENNESSEE CENTENNIAL EXPOSITION

It is gratifying, to be able to say, that Georgia was the only State, at THE TENNESSEE CENTENNIAL EXPOSITION, that was awarded a gold medal for its *Display of Minerals, Ores and Building-stones.* A silver medal, the highest prize in the Forestry Department, was awarded to Georgia, for its systematic collection of *Forest-tree Sections.* This display was made from the duplicates of the collection, on exhibition in the State Museum. A silver medal was also awarded to Georgia, for the best display of Verde Antique. This exhibit consisted of a handsome polished 8-foot column of serpentine, surmounted with a gold-leaf-covered Corinthian cap, on which rested a 10-inch polished serpentine ball; and a card-receiver of serpentine, on a turned and polished column of the same material. This display was kindly prepared for, and loaned to the State, by THE VERDE ANTIQUE MARBLE CO., of Chicago, it being the product of their quarries, at Holly Springs, Cherokee County, Ga.

THE STATE MUSEUM EXHIBIT AT THE TRANS-MISSISSIPPI AND INTERNATIONAL EXPOSITION

In accordance with the resolution of the General Assembly, at its last session, authorizing Your Excellency to appoint a Commission, to collect and make an exhibit for the State at the Trans-Mississippi and International Exposition at Omaha, Nebr., and directing that the collections of the State Museum be turned over to that Commission, I, as *ex-officio* Curator of the Museum, delivered the fruit collection, four cases of the Mineral collection, four tables of the Ore collection, and the collection of Building-stones, to Ex-Governor W. J. Northen, Chairman of the Commission. I also secured, for the Commission, from THE GEORGIA MARBLE CO., of Tate, Ga., the 4 handsome Corinthian columns of Pickens county, marbles of various colors, which they had loaned me for the exhibition at the Nashville Exposition. As the arrangement and classification of the minerals and ores required knowledge of a technical nature, it was necessary, for some one from the Survey to go to Omaha, to install these collections. On account of urgent work on the report on the Gold Deposits, which was then going through the press, it was not expedient for me to go. But, having been furnished a plan of the first floor of the Georgia State Building by Governor Northen, I laid out the plan, for installation, on paper, and sent my clerk, Mr. F. E. Ellis, whom I had trained to Museum work, to carry out the details of classification and installation. The collections being classified in the boxes, in which they were packed, it only remained to transfer them from the boxes to the cases, in their regular order. I have every reason to believe, that

this work was done satisfactorily. Subsequently, on account of insufficient space, it became necessary for Governor Northen to make some modifications of my plans, in order to accommodate the Fruit exhibit, on the first floor. But this was done, doubtless, without affecting the attractiveness of the display.

ACKNOWLEDGEMENT TO THE ADVISORY BOARD

In concluding this report, it affords me much pleasure, to testify to the pleasant relations, that continue to subsist between the members of THE ADVISORY BOARD and myself; and I wish to acknowledge my thanks to them, for the uniform courtesy and kind consideration, with which I have been treated, at their hands.

Very respectfully yours,

W. S. YEATES,

State Geologist and Ex-Officio Curator of the State Museum.





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